

CLAIMS

What is claimed is:

1. A composite vehicle panel comprising;
a first layer;
a second layer;
a middle layer disposed between said first and second layers, and said
5 middle layer having at least one aperture through which said first and second
layers are bonded together.
2. The composite vehicle panel of claim 1 wherein said middle layer is
comprised of a substantially rigid material.
3. The composite vehicle panel of claim 2 wherein said rigid material is wood
fiberboard.
4. The composite vehicle panel of claim 1 wherein said first layer is
comprised of a fabric.
5. The composite vehicle panel of claim 4 wherein said fabric is non-woven.
6. The composite vehicle panel of claim 4 wherein said fabric is selected
from the group consisting of wool, cotton, acrylic, polybenzimidazole, aramid,
rayon or other cellulosic materials, carbon, glass, novoloid fibers, polyethylene,
polypropylene, polyester, nylon, polyphenylene sulfide, polyether sulfone,
5 polyether-ether ketone, vinyon, and any combination of two or more of the
foregoing.
7. The composite vehicle panel of claim 1 wherein said second layer is a
sheeting material.

8. The composite vehicle panel of claim 7 wherein said sheeting material is selected from the group consisting of thermoplastic olefin (TPO), rubber modified polypropylene, polyethylene homopolymer and copolymer (HDPE, LDPE, solid and foam), ethylene-propylene ethylidene (EPDM), filled ethylene vinyl acetate (EVA), acrylic rubber, butadiene rubber, nitrile-butadiene rubbers, styrene-butadiene rubbers, isoprene rubbers, butyl rubbers, nitrile rubbers, polyurethane rubbers, natural rubber, polyvinyl chloride (PVC), polyurethane (solid and foam), polyester, polystyrene, acrylonitrile butadiene styrene (ABS), polyamides, ionomers, acrylics, fluoropolymers, polycarbonates, bituminous material, metal material, and any combination of two or more of the foregoing.

9. The composite vehicle panel of claim 1 wherein;
said first layer is a fabric; and
said second layer is a sheeting material.

10. The composite vehicle panel of claim 1 wherein said first and second layers are bonded together by ultrasonic welding, radio frequency (RF) welding, glues, hot melt adhesives, laminating processes, stitching, needle punching, or by mechanical means such as staples or clips.

11. A method of manufacturing a composite vehicle panel, said method comprising the steps of:

disposing a middle layer between a first layer and a second layer, the middle layer having an aperture; and

5 bonding the first layer to the second layer through the aperture.

12. The method of manufacturing a composite vehicle panel of claim 11, said method further comprising the step of:

disposing at least one additional layer of material between the first and second layers.